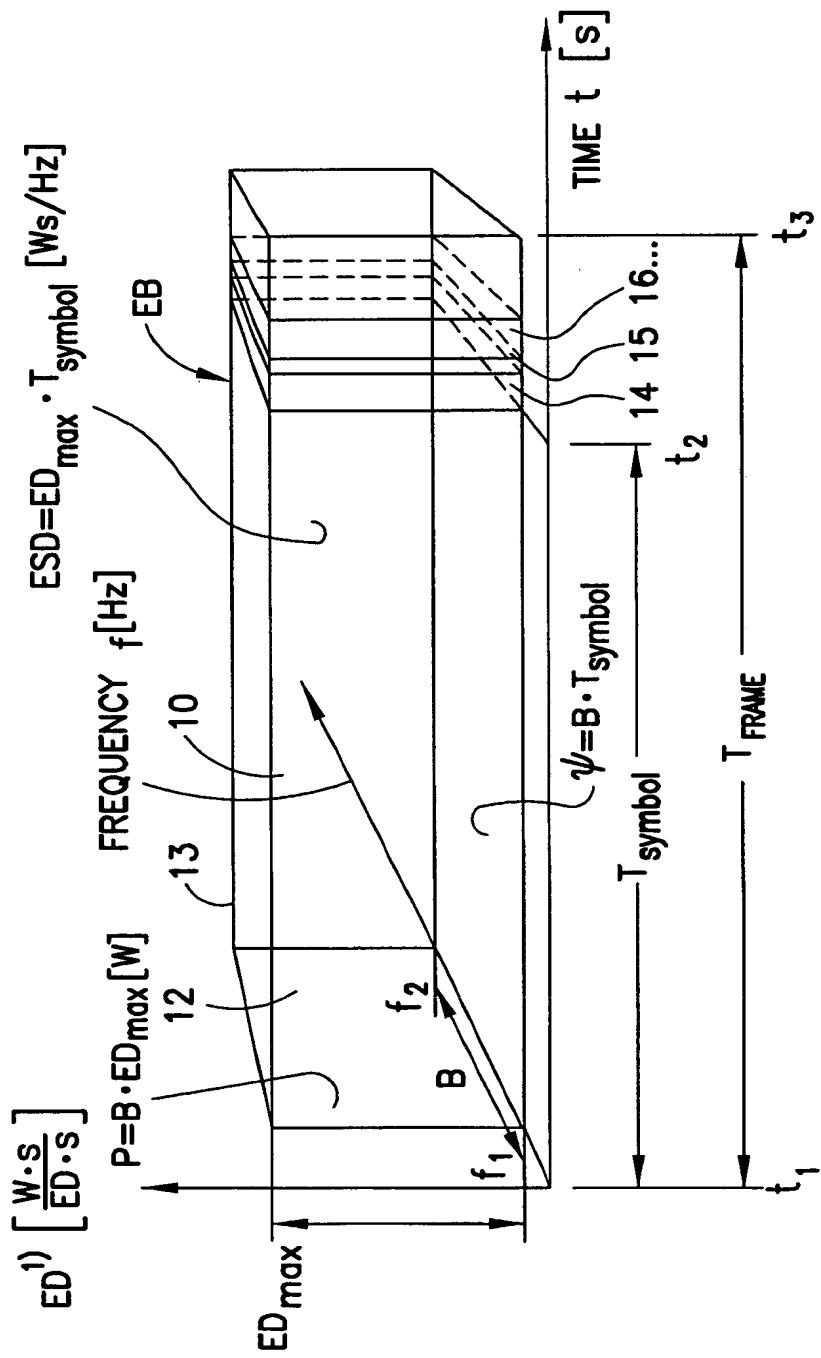


# REPLACEMENT SHEET



1) ED: ENERGY DENSITY ACCORDING TO WIGNER–VILLE

FIG. 1

# REPLACEMENT SHEET

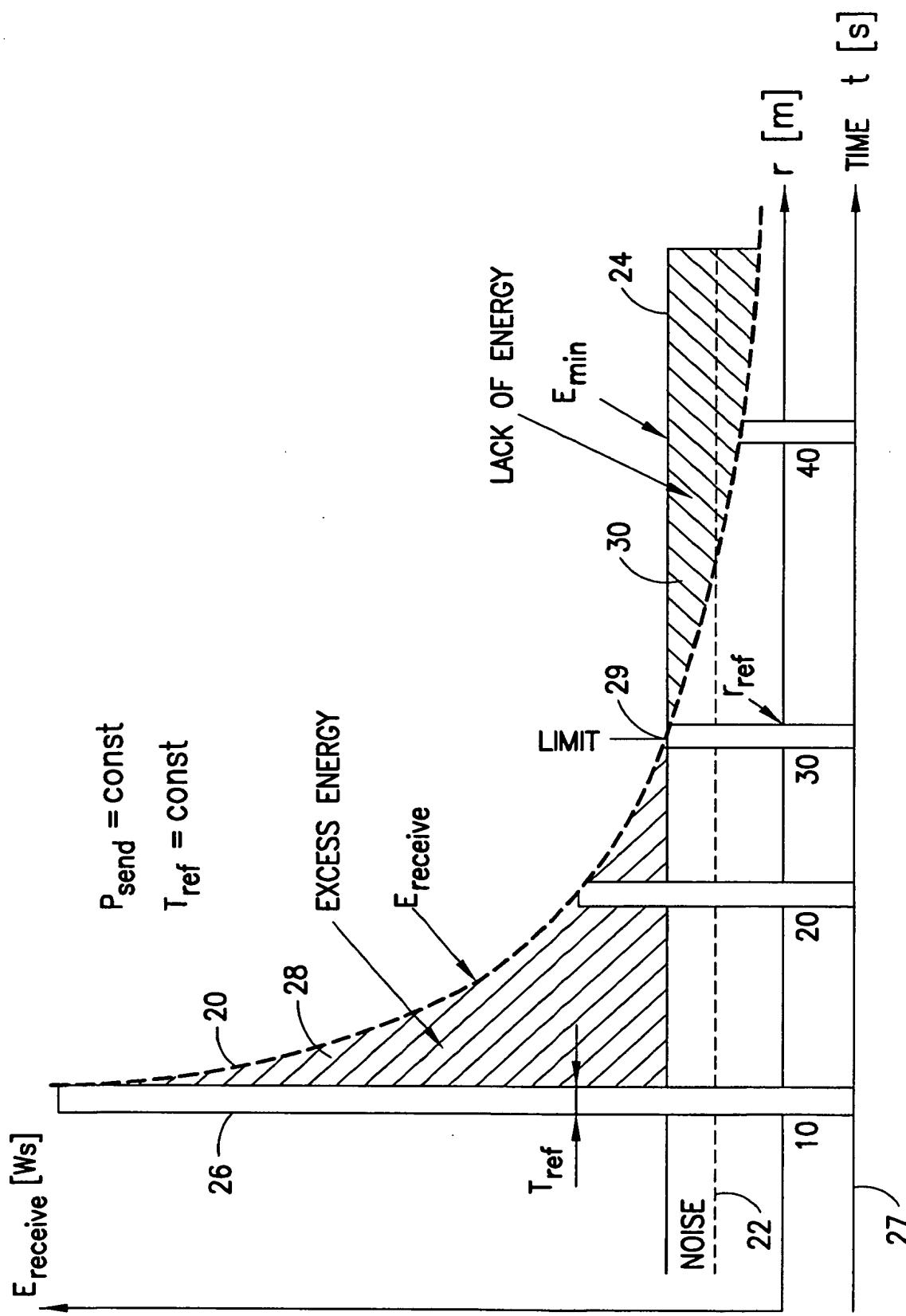


FIG.2

# REPLACEMENT SHEET

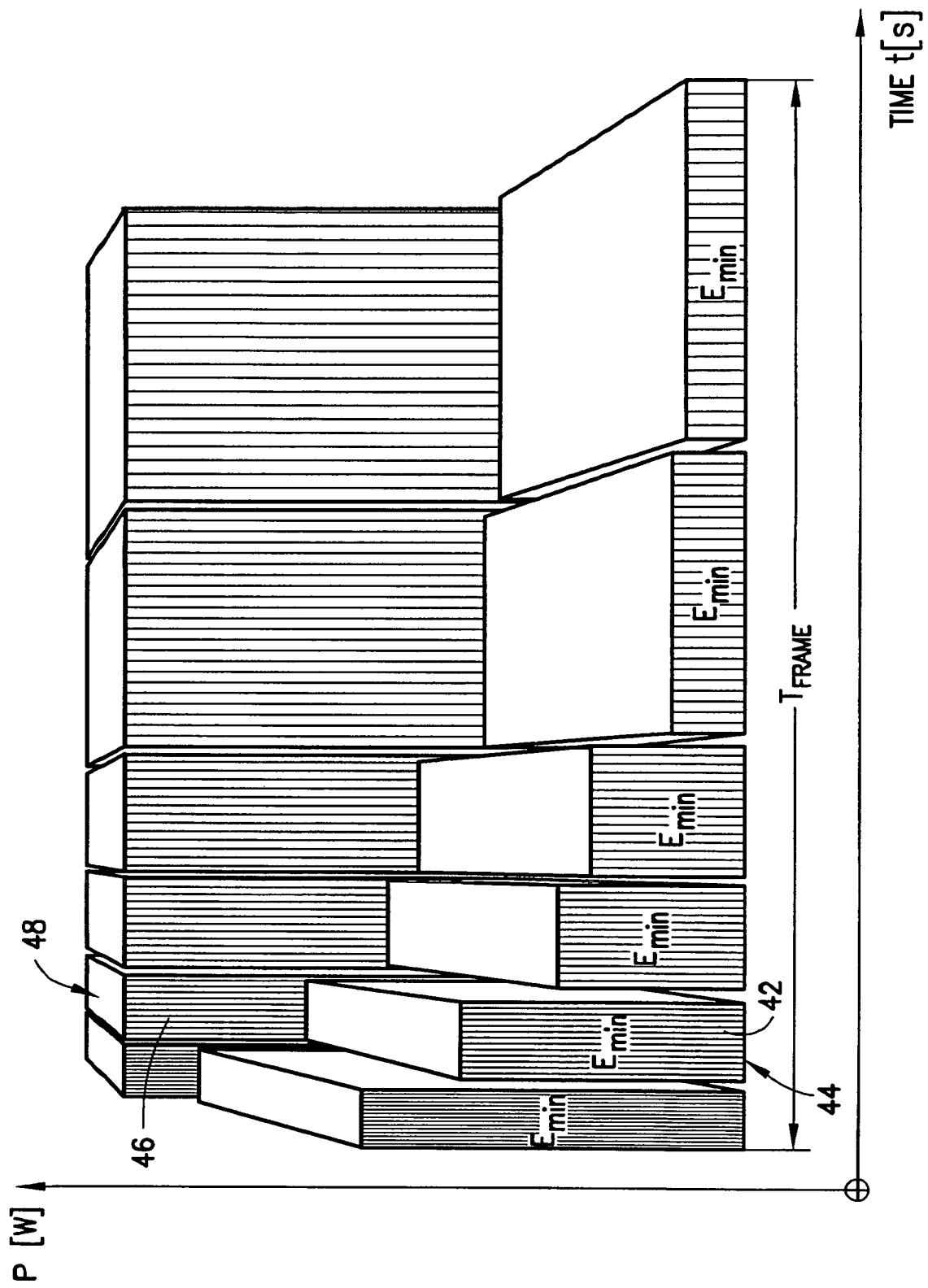


FIG.3

# REPLACEMENT SHEET

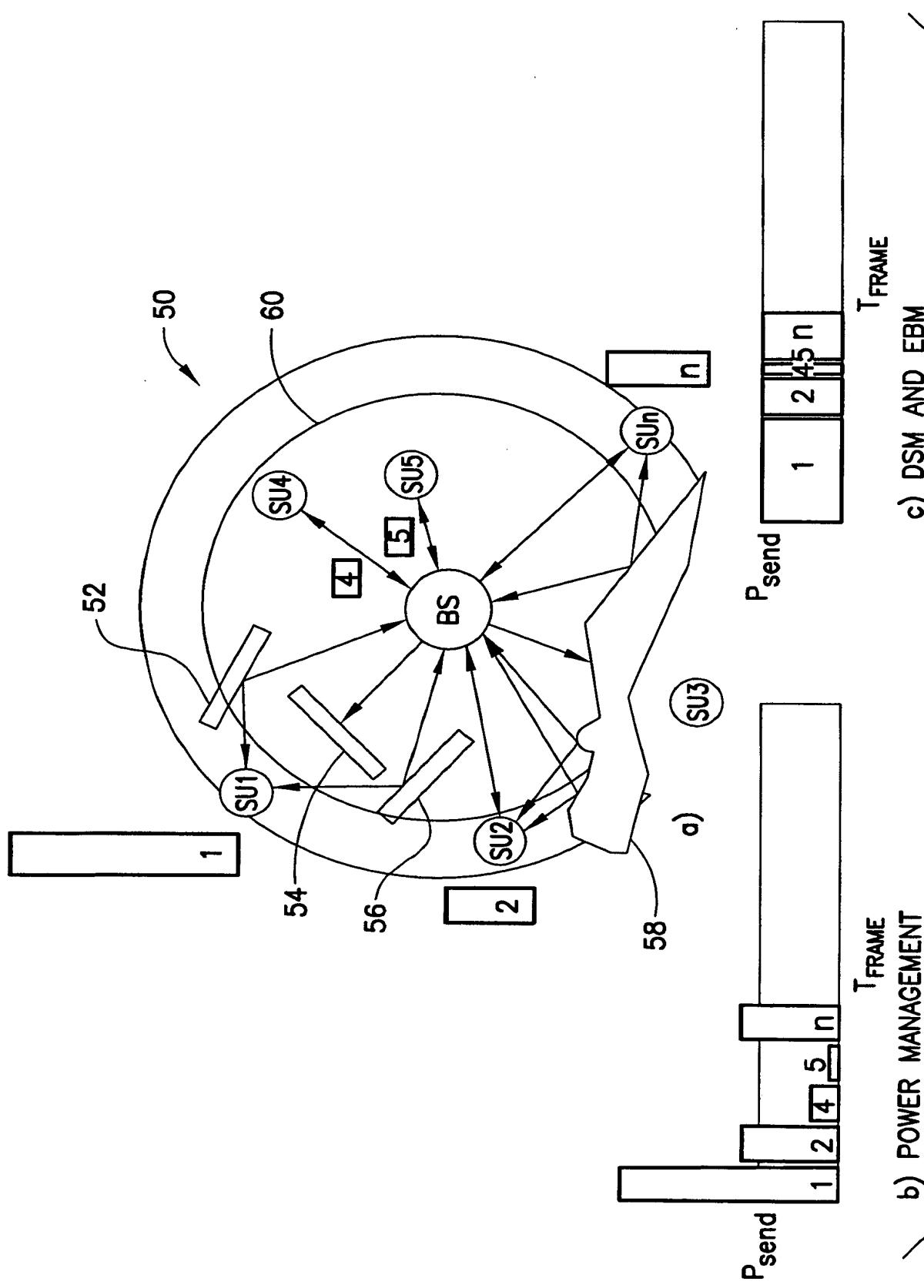
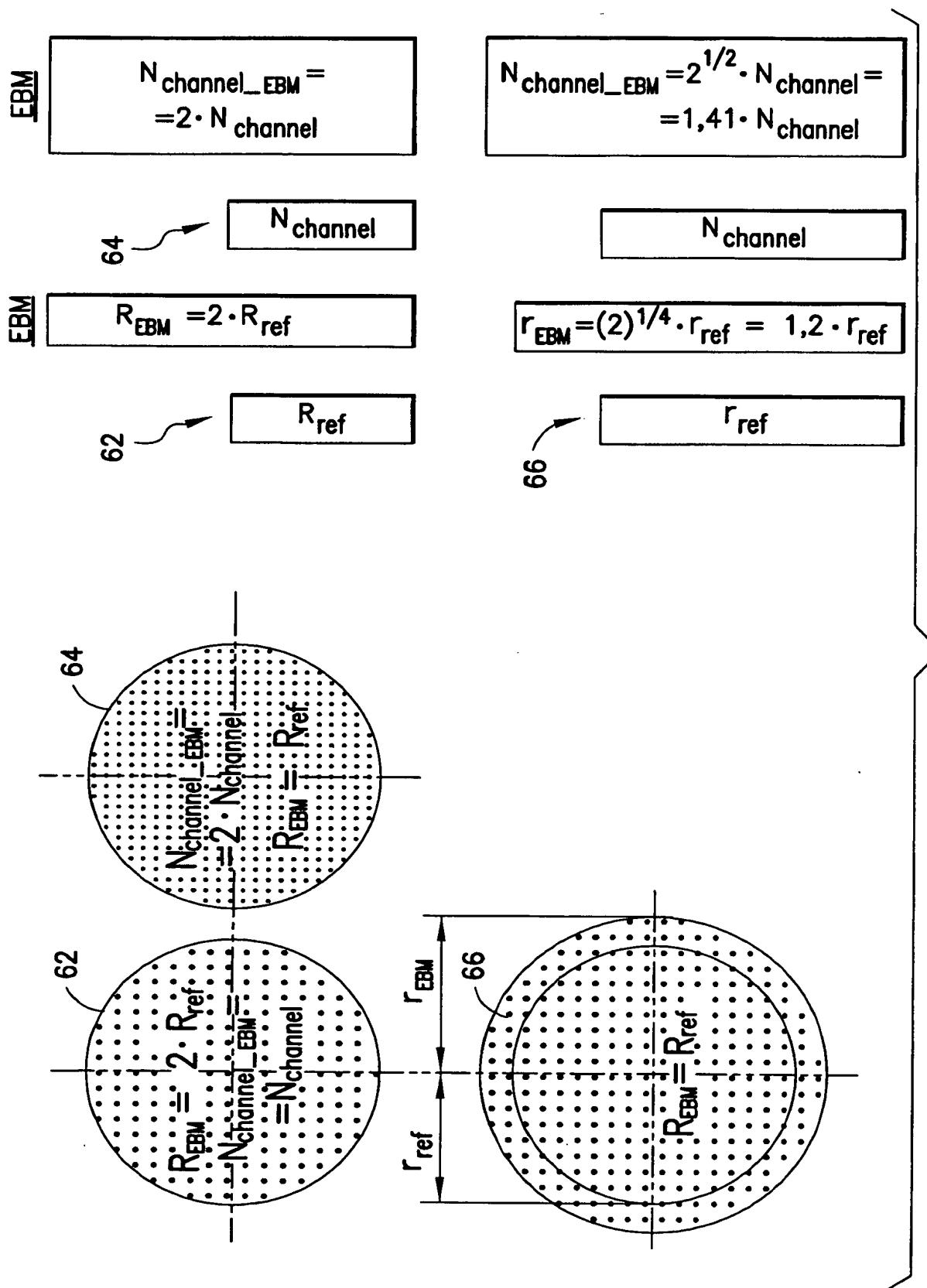
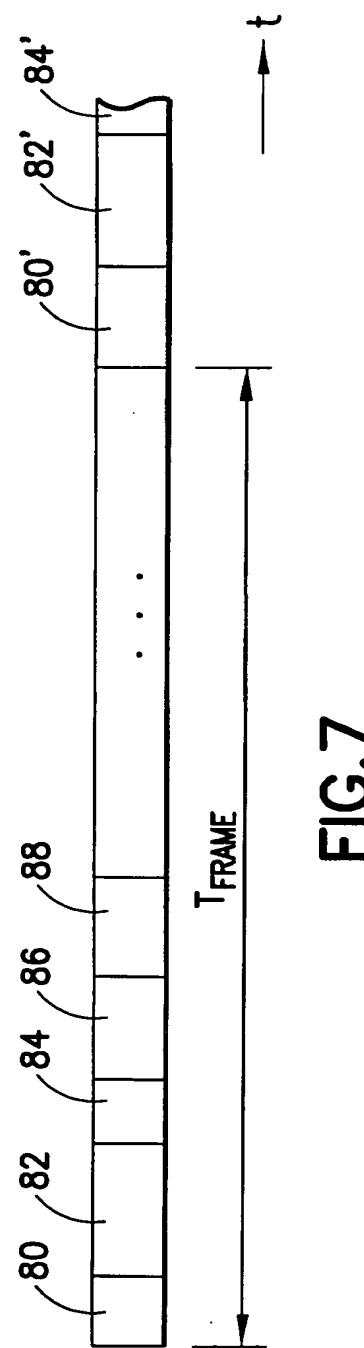
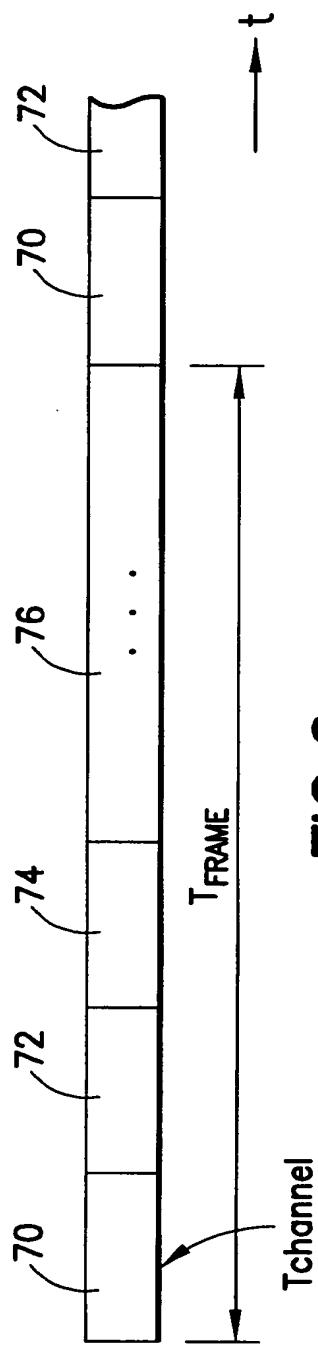


FIG.4

# REPLACEMENT SHEET



# REPLACEMENT SHEET



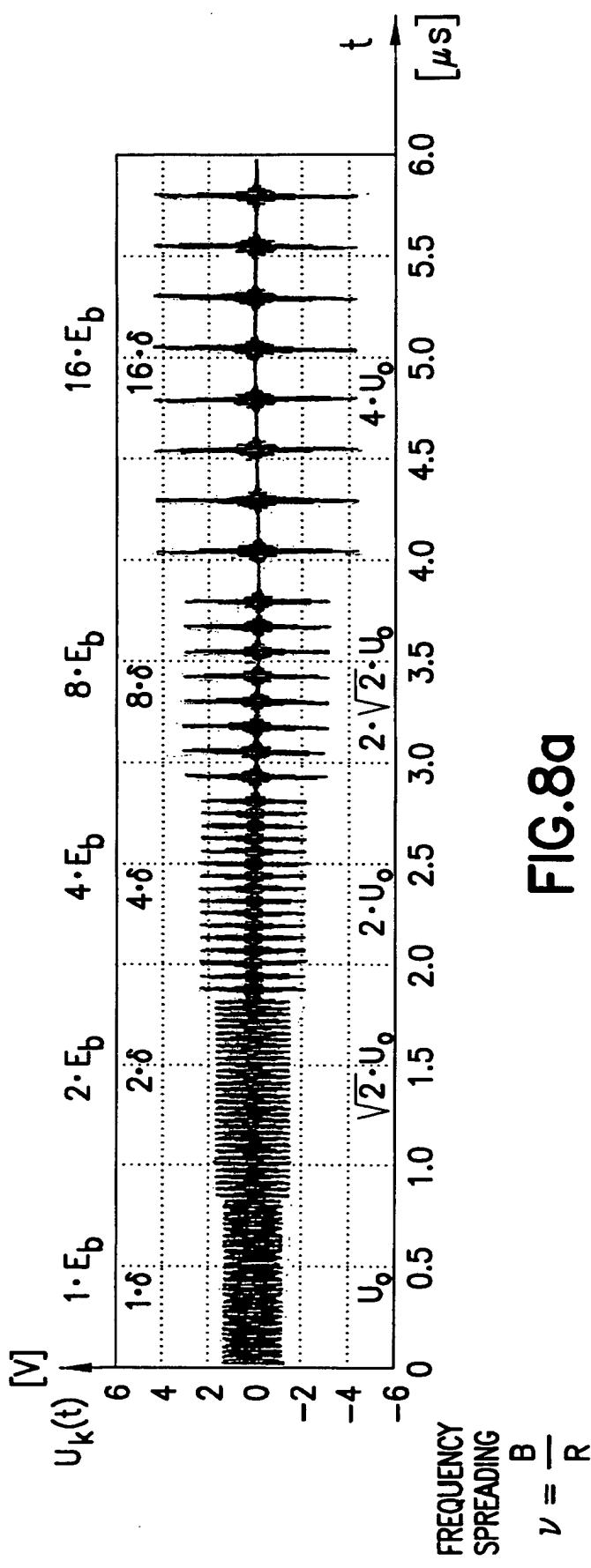
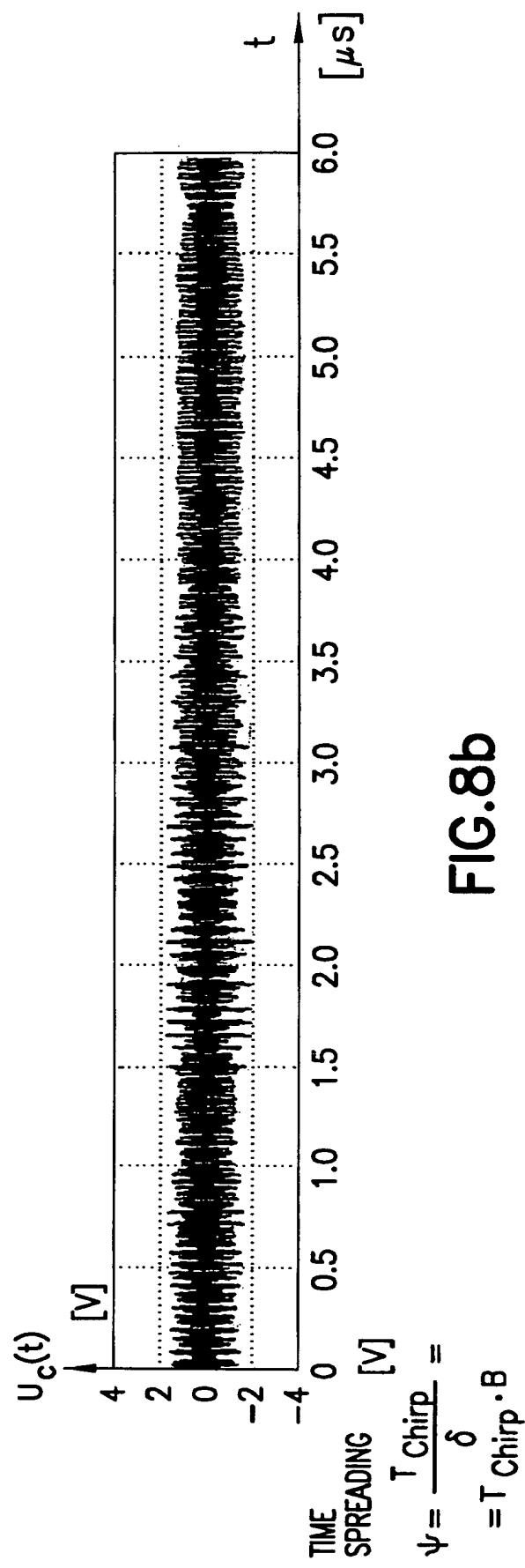


FIG. 8a



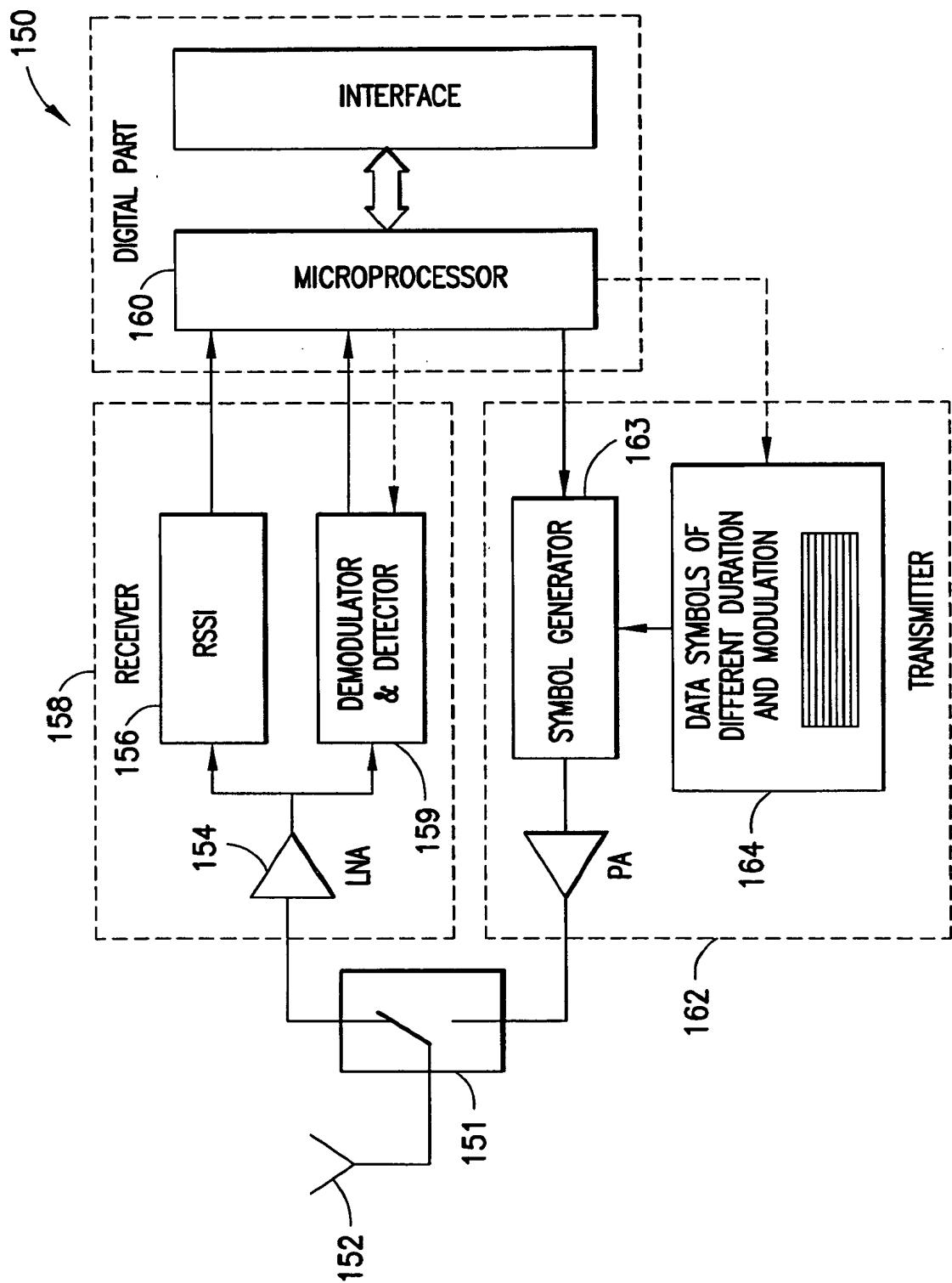


FIG.9

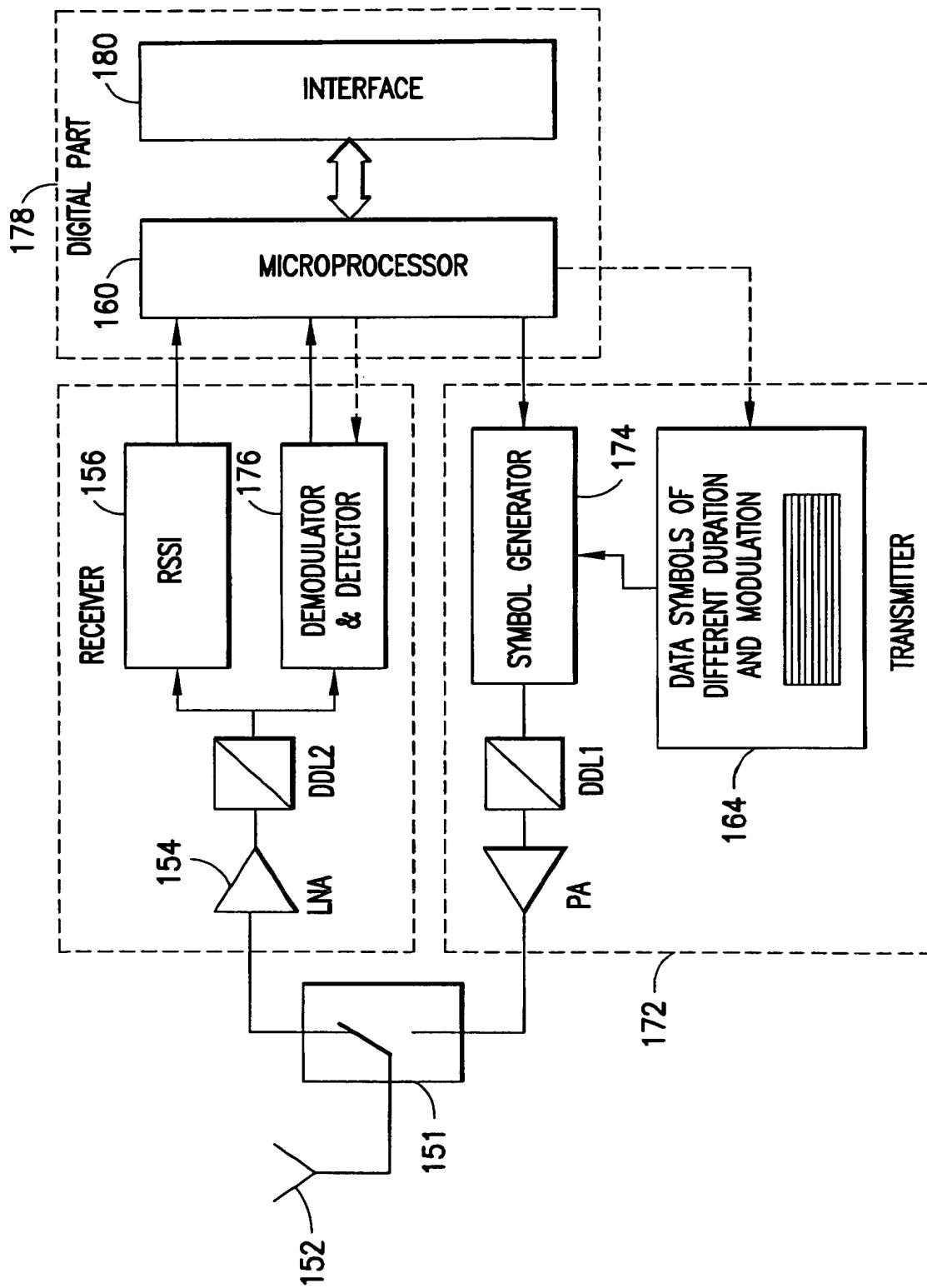


FIG. 10

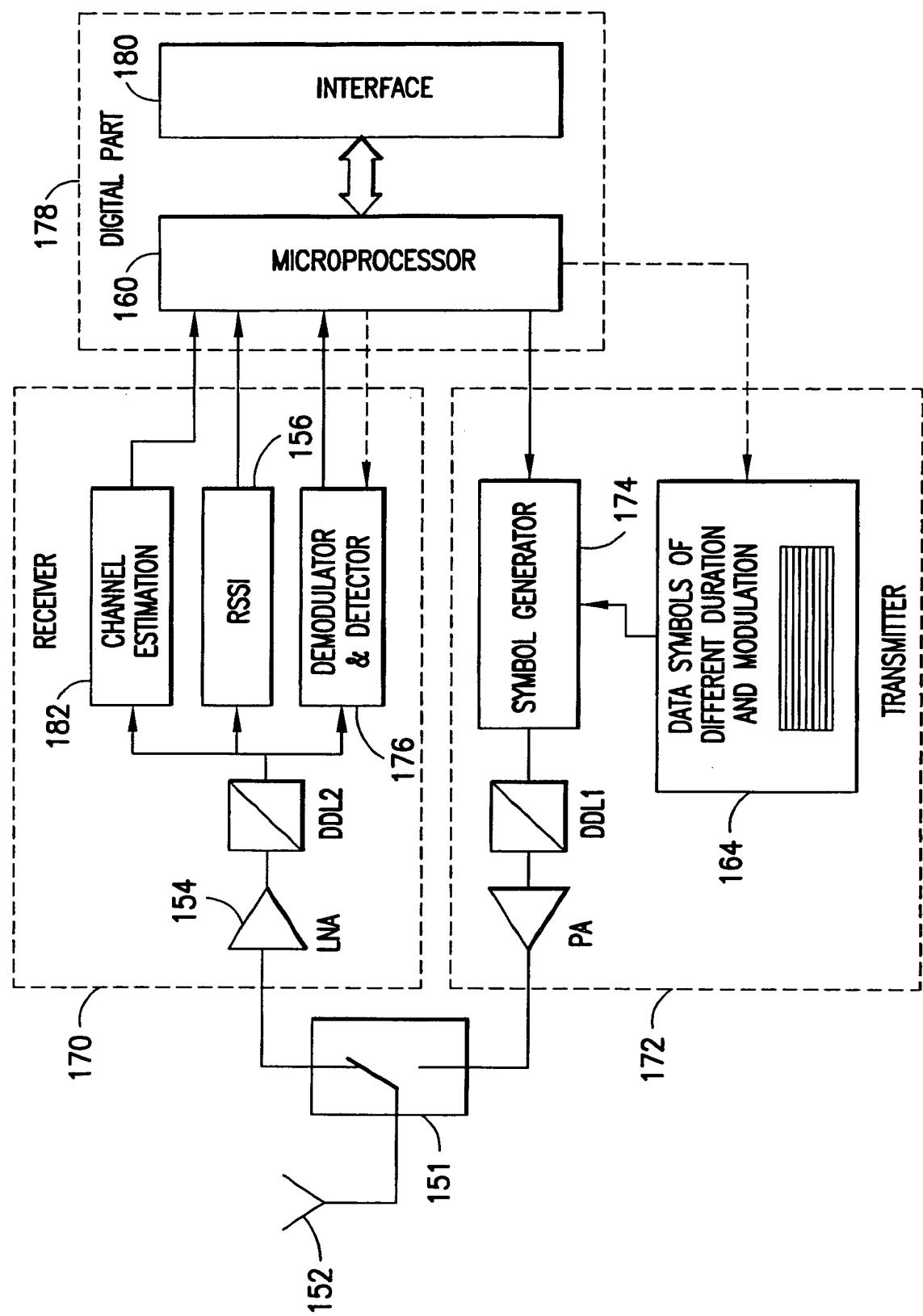


FIG. 11

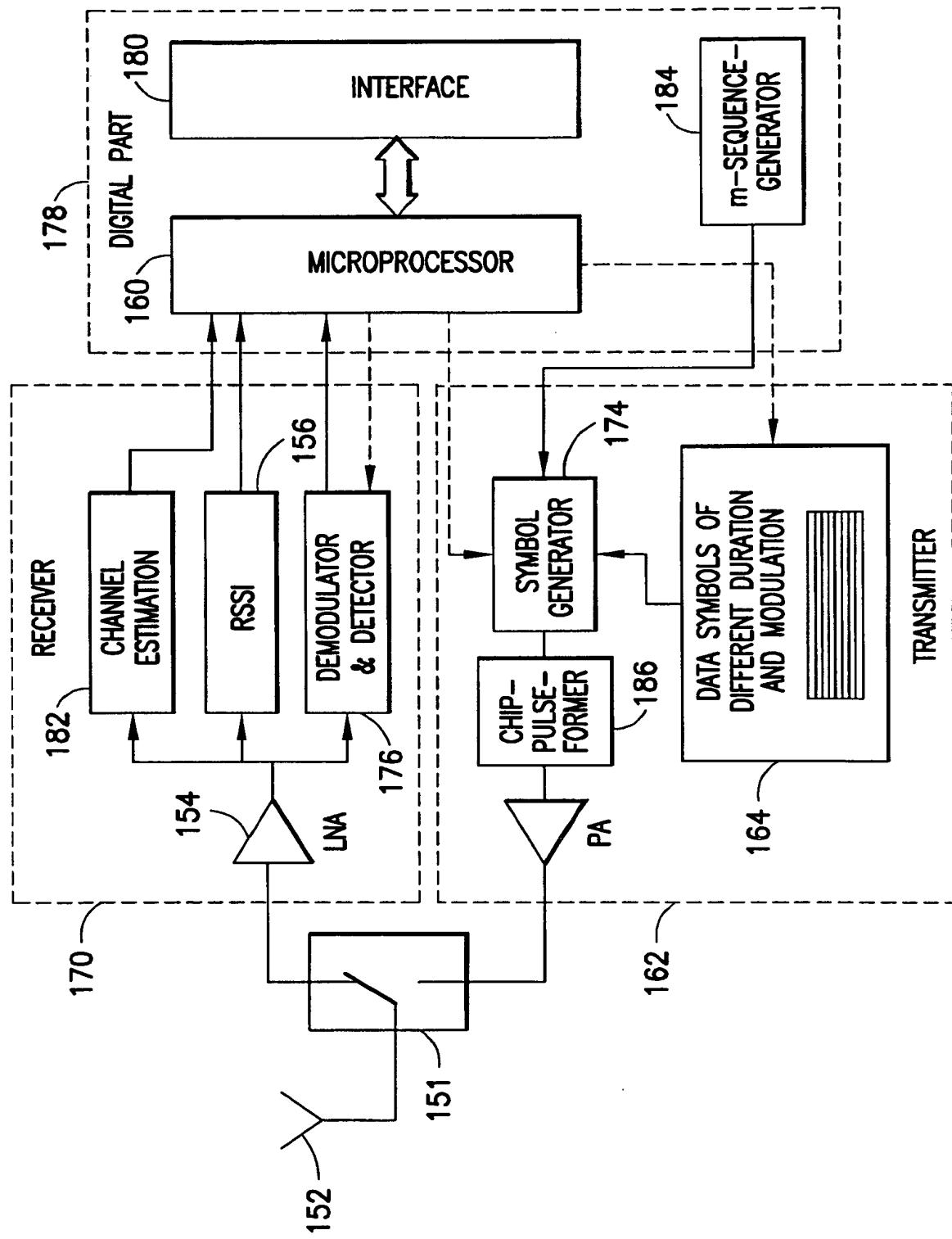
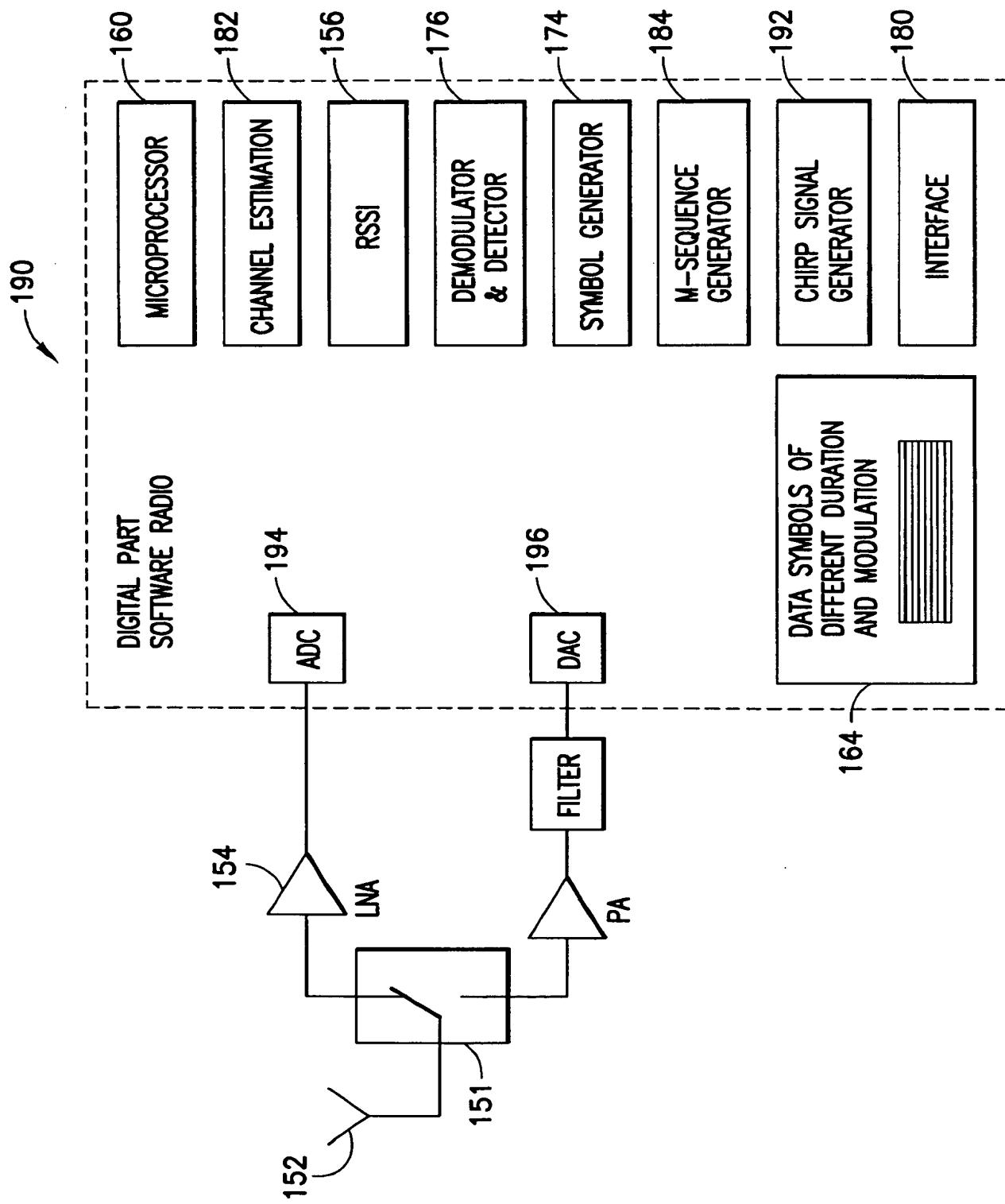


FIG. 12

# REPLACEMENT SHEET

FIG. 13



202

200

transmitting a plurality of symbols each having at least one bit from a transmitter to at least one receiver using at least one channel and a predetermined transmission power,

-wherein the symbols are transmitted with a receiver-specific transmission energy which on the part of the receiver results in the reception of the symbol with a reception energy which corresponds to an upper limit value associated with the receiver or a lower value of an error recognition rate in comparison with the upper limit value, and

-wherein to achieve the receiver-specific transmission energy and at the same time a bit rate which is as high as possible in dependence on the currently prevailing transmission conditions between the transmitter and the receiver the symbol duration or the number per symbol of transmitted bits or the symbol duration and the number per symbol of transmitted bits are adapted

204

206

exclusively the symbol duration is adapted

208

selecting between three available adaptation options, namely adaptation of the symbol duration, adaptation of the number per symbol of transmitted bits and adaptation both of the symbol duration and also the number per symbol of transmitted bits

210

in channel-specific fashion on time average the predetermined transmission power and/or the radiated electrical field strength and/or the radiated magnetic field strength and/or the spectral power density in the context of admissible power radiation or a parameter correlated with one or more of said parameters assumes a limit value corresponding to the maximum possible transmission energy per unit of time in the context of admissible radiation

212

the predetermined transmission power is at a maximum on time average in the context of the technical design of the transmitter

# NEW SHEET

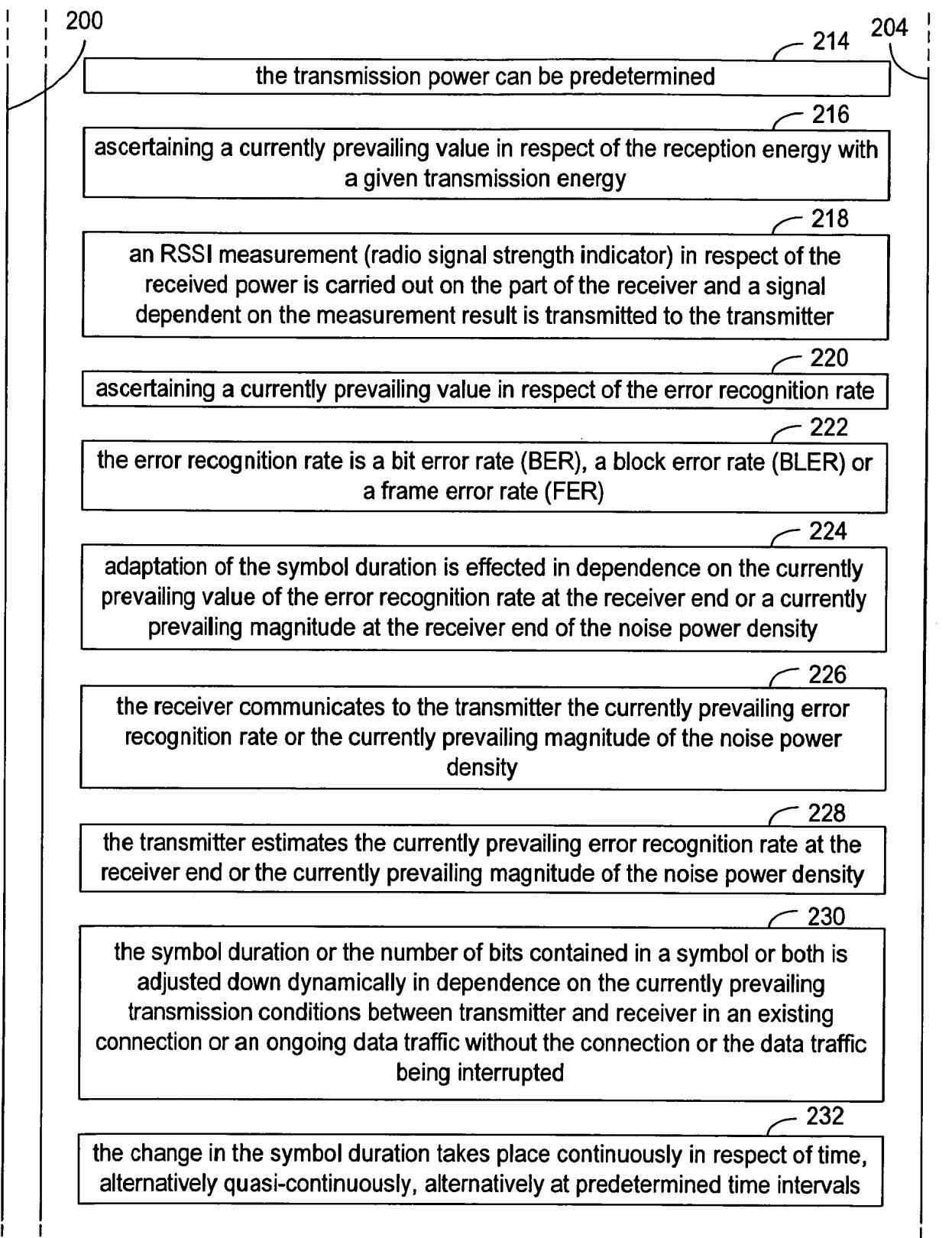


FIG. 14

part 2 of 4

200

the symbol duration is adapted in channel-specific fashion, that is to say individually on each channel used

204

234

the symbol duration is restricted towards short symbol duration values in channel-specific fashion by the bandwidth of the channel

236

the symbol duration is determined from a continuous value spectrum

238

240

the symbol duration is determined from a discrete value spectrum, wherein the discrete value spectrum contains the integral multiples of a symbol duration which is the shortest possible in channel-specific relationship

242

the symbol duration  $T_{symbol}$  is determined at the transmitter end in accordance with the formula:

$$T_{symbol} = \frac{E_{min} \cdot \left( \frac{r}{r_0} \right)^\alpha}{P_{send}}$$

wherein  $E_{min}$  is the reception energy corresponding to the upper limit value associated with the receiver in respect of the error recognition rate,  $P_{send}$  is the maximum transmission power,  $r$  is the distance between transmitter and receiver,  $r_0$  is a reference distance and  $\alpha$  is a propagation coefficient

244

the selection of the number per symbol of transmitted bits is effected in dependence on the currently prevailing value of the error recognition rate at the receiver end or on a currently prevailing magnitude at the receiver end at the noise power density

246

the number per symbol of transmitted bits is adapted in channel-specific relationship

248

adaptation of the number per symbol of transmitted bits is effected when a symbol duration which is shortest in channel-specific relationship is already used

# NEW SHEET

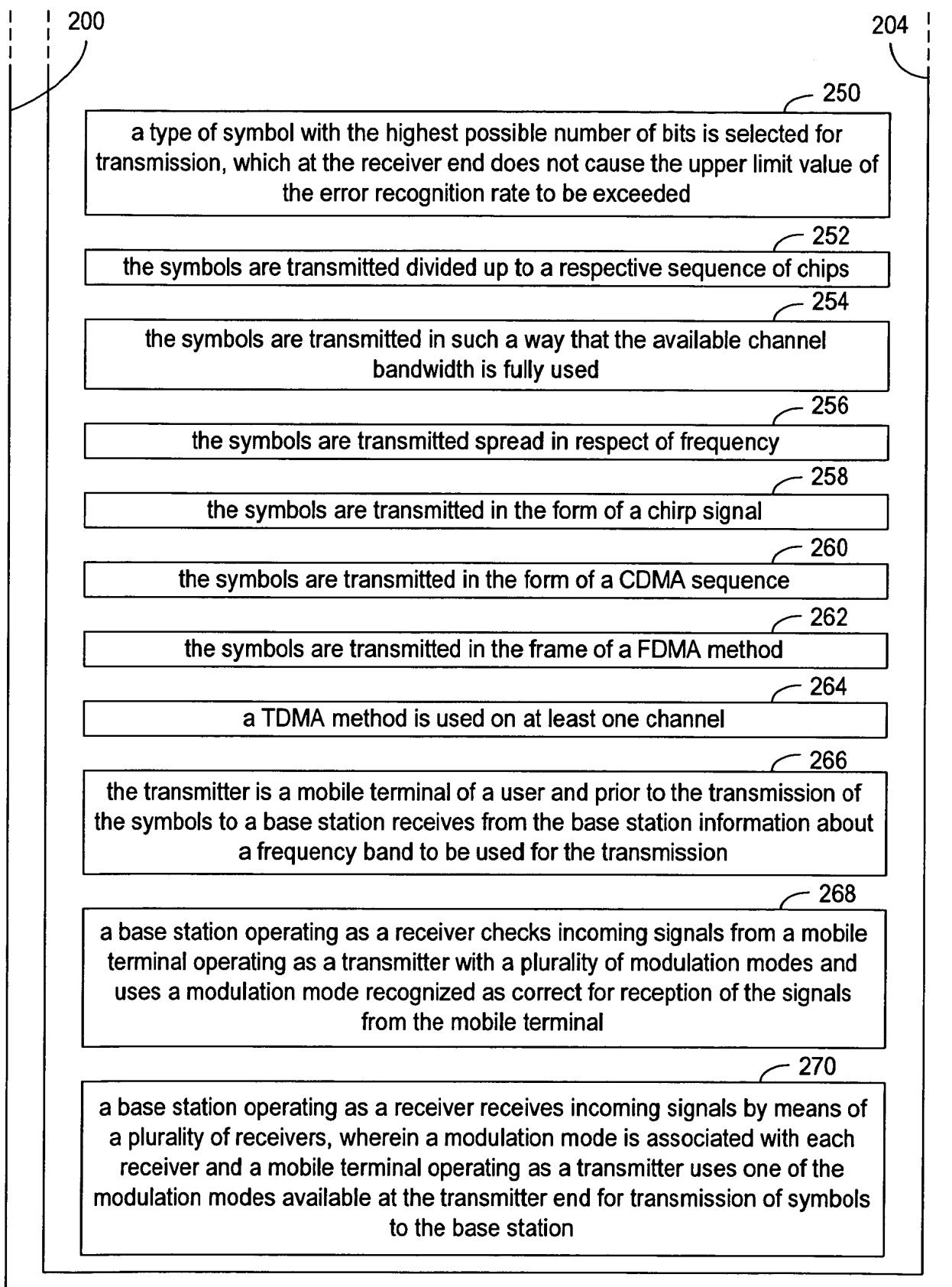


FIG. 14

part 4 of 4

272

the error recognition rate is ascertained by determining the number of errors within a received data frame

274

the error recognition rate is ascertained by averaging the number of errors in a plurality of data frames

## FIG. 14a

276

the error recognition rate is ascertained by means of the number of negative receipt signals from the receiver over a predetermined period of time

## FIG. 14b

278

the symbols are spread in respect of frequency by being modulated with a noise or pseudo-noise sequence, the noise or pseudo-noise sequence being known to the receiver

## FIG. 14c

280

the noise or pseudo-noise sequence is dynamically adapted to the selected symbol duration

## FIG. 14d

282

chirp signals from the transmitter, which are intended for a respective receiver, are superimposed in respect of time

## FIG. 14e

284

the total of the transmission powers, radiated in a moment in time, of the mutually superimposed chirp signals is equal to the maximum admissible transmission power on the respective channel

## FIG. 14f

286

division into FDMA channels is effected dynamically in such a way that a lower bandwidth is allocated to receivers with good channel transmission conditions

## FIG. 14g

300

transmitting a plurality of symbols each with at least one bit from a transmitter to at least one receiver using at least one channel and a predetermined transmission power,

- wherein the symbols are transmitted with a receiver-specific transmission energy which on the part of the receiver leads to the reception of the symbol with a reception energy which corresponds to an upper limit value associated with the receiver or a lower value of an error recognition rate,
- wherein in dependence on the currently prevailing transmission conditions between the transmitter and each individual receiver to achieve the receiver-specific transmission energy and at the same time a bit rate which is as high as possible the symbol duration, or the number per symbol of transmitted bits, or the symbol duration and the number per symbol of transmitted bits are adapted

## FIG. 15